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PESTICIDES

Study on bee-killing chemical offers ammo for policy fight

Marc Heller, E&E News reporterPublished: Wednesday, July 8, 2020

A bee on a clover. Photo credit: Jo Zimny Photos/Flickr



Neonicotinoid pesticides have been blamed for harming bee colonies. Jo Zimny Photos/Flickr

A class of pesticides notorious for harming bees does little to boost farmers' crop yields or profits — but it's a form of crop insurance in case of insect outbreaks, according to Cornell University researchers.

The scientists examined the risks and benefits of neonicotinoids, the nicotine-based insecticides that have become hugely popular on farms since their introduction in the United States in 1991.

Four of the chemicals are in final stages of registration renewal at EPA, where officials have rejected calls from environmental groups to ban their use. Instead, the agency has imposed restrictions on their use, including label instructions to limit when and where they're used to reduce exposure to bees.

In their 432-page [report](#), the Cornell researchers didn't make policy recommendations but delved deeply into neonic's use in New York, a major producer of specialty crops as well as field corn used to feed dairy cows. The results lend support to arguments on both sides of the controversy around neonic.

Researchers found that around 90% of field tests showed no increase in corn yields from seeds treated with neonics, compared with chemical alternatives or untreated seed. Some 89% of field trials showed no increased yield compared with plots where no insecticide was used.

They found similar results with soybeans.

"Nevertheless, neonicotinoid-treated seeds are used by nearly all conventional field corn farmers and, likely, the majority of soybean producers in New York," the study said.

"In part, this is due to the insurance value of neonicotinoid-treated seeds. Even if routine use of neonicotinoid-treated seeds does not increase expected net income, such preventative pest control products protect growers against unpredictable, potentially severe, losses from early-season pests."

It added, "Incentives and policies to reduce usage of neonicotinoid-treated seeds may benefit from recognizing their value as inexpensive crop insurance as well as a pest management tool."

Treated seeds cost farmers about \$49 more per hectare than nontreated seeds, researchers found.

A senior scientist at the Center for Biological Diversity, Nathan Donley, told E&E News that the Cornell work stands out for examining independent, peer-reviewed studies on the chemicals, rather than relying mainly on industry studies that have weighed heavily in EPA's analyses.

"That's probably why they are much more clear and definitive about the major harms that neonics pose to pollinators," Donley said. "EPA discounted nearly every single independent study in the peer-reviewed literature in their risk assessment, which is the main reason they are moving forward with such a permissive approval."

A spokesman for the New York Farm Bureau, Steve Ammerman, said pesticides aren't the only potential contributor to the decline in pollinators.

"The more information we have, the better we can work to implement new strategies to benefit pollinators and farmers," Ammerman said. "Neonics have been an important and effective risk management tool to agriculture and were developed to be safer alternatives than products used decades ago."

The first neonic to hit the market was imidacloprid in 1991. Since then, they have become some of the most widely used pesticides in the world, constituting more than 25% of the global pesticide market, according to the report. Farmers use them mainly in treated seeds, which spread the chemical throughout the plant — including into pollen and nectar that bees collect.

Researchers said only 5% of corn acres in New York were treated with other insecticides in 2018, and just 13% of corn acres nationally, a testament to neonics' widespread use.

In its proposed registration renewal for imidacloprid released earlier this year, EPA recommended reducing the amounts that can be applied annually to plants or soil. Cornell researchers said the interim decision would affect major New York crops such as apples and cabbage, in which the state ranks in the top three nationally.

The agency also issued interim registration decisions for acetamiprid, clothianidin, dinotefuran and thiamethoxam. EPA proposed no changes in some uses of imidacloprid but noted the danger to pollinators from neonics overall and proposed canceling imidacloprid's use as a spray on turf to reduce risk to people, and use on bulb vegetables to reduce risk to aquatic species from runoff.

The agency turned away requests for wide new restrictions on their use, such as an outright prohibition (*E&E News PM*, Jan. 30).

Policy implications

Other findings in the Cornell study could play into future policy decisions.

Although they found that the risk to bees varies widely across landscapes — with very little risk in some settings — the researchers called "particularly concerning" the amount of neonicotinoids in soil, at levels known to be toxic to ground-nesting bees.

Fifty-four percent of New York's 417 species of bees nest in the ground, the study said.

Donley said EPA hasn't fully addressed the risk to ground-nesting bees, putting much of its focus on honeybees that are raised commercially and are easier for experts to track.

In some cases, neonics appear to be the only treatment that works on the insects in question, according to the researchers.

They said that's the case with the woolly adelgid, an imported insect that's destroying eastern hemlock trees — the third-most common tree in New York and an important species to the state's timber industry. Infested trees nearly always die, and the pesticide is injected into the tree in ways that pose little harm to bees, the study said. Hemlocks are pollinated by wind.

"Ending control of hemlock woolly adelgid with neonicotinoids could have severe consequences for New York forests," the researchers said.

Researchers also said they found a surprising lack of information about the risks and benefits of neonics used on specialty crops.

Climate change could affect the chemicals' use in New York, the study said, but could mean either more or less depending on how insects respond to wetter springs, drier falls and warmer overall conditions.

At the New York Farm Bureau, Ammerman said the group is examining the findings and believes the state Department of Environmental Conservation and EPA, not lawmakers, should drive policies on neonics.

"We do not support the banning of classifications of pesticides by legislative bodies and believe that regulatory agencies, like NYS DEC and the EPA, should be making these decisions based on the science," Ammerman said.

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